



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,915	03/13/2001	Takeyuki Goto	108889	8925

25944 7590 08/21/2003

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

WINTER, GENTLE E

ART UNIT	PAPER NUMBER
----------	--------------

1746

DATE MAILED: 08/21/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/803,915

Applicant(s)

GOTO ET AL.

Examiner

Gentle E. Winter

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 15 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments/Amendments

1. Applicant stated:

The Office Action acknowledges that the plurality of ventilating holes of different aperture areas is not disclosed or suggested by Shimizu (Office Action, page 3, lines 1-3).

2. More precisely the Office action at page 3, line 1 *et seq.* stated:

What is not explicitly disclosed is that the plurality of ventilating holes (element 11), have total aperture area is larger than a total aperture area of the ventilating holes formed in the upper covering member. This is believed to be inherent, or if not inherent overtly obvious and consistent with well known and documented design protocol. However, in the event that applicant takes the position that the different hole sizing is not inherent or well known in the art, '454 is provided for the teaching of different hole sizes.

3. Applicant further stated:

In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from, the teachings of the applied prior art (emphasis in original).

4. A careful reading will make it clear that the examiner did not rely on the inherency statement. As such the entire argument with respect to inherency is moot. A secondary reference was provided, the secondary reference explicitly teaches the inherent feature. Thus even if applicant position with respect to inherency was fully accepted, which it is not, the issue has been resolved in applicant's favor, the element is explicitly taught in the secondary reference.

5. Applicant arguments with respect to motivation for making the combination

The Office Action cites Strickler as a secondary reference in the event that the "aperture area" feature is not inherent in Shimizu (which it is not, as discussed above) because Strickler teaches holes of different aperture areas. However, as discussed below, there would have been no motivation to combine Shimizu and Strickler, and even if combined, the result would not have been the claimed invention.

First, regarding the motivation to combine references, the Office Action asserts that it would have been obvious to make the combination for the purpose of reducing the load on a fan. It is true that Strickler cites fan load reduction as a reason for Strickler's disclosed aperture configuration. However, this teaching is entirely irrelevant in the context of the Shimizu structure, for the following reason. According to Strickler, a fan is inside an enclosure, and it is in this context that the load reduction occurs with the disclosed

Art Unit: 1746

aperture configuration. In contrast, in Shimizu, there is no fan disclosed inside the battery case; the space is occupied nearly entirely by the batteries, and putting a fan inside the case would undesirably increase the size of the case. Thus, there is no problem of increased fan load in the Shimizu apparatus.

6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the secondary reference is provided for the teaching of different hole sizes. The motivation for making the combination is the same as is explicitly disclosed in the '454 reference. Specifically, see e.g. column 3, line 62, disclosing why it is desirable to have relatively larger sized exhaust holes. Specifically, cooling fan modules are required work harder if they have to blow, or push, cooling air through relatively smaller-sized exhaust apertures. This additional load proves to be much more difficult and inefficient than drawing cooling air through these smaller-sized exhaust apertures. It is noted that the '454 invention is drawn to a system that overcomes the shortcomings of the prior art systems that operate with relatively larger exhaust ports. See figure 1 of the '454 reference disclosing the prior art of record systems. It is noted that the future intended use of blowing or drawing is irrelevant to anything but motivation. The resulting structure is identical to that of applicants'. Further, even if a fan is mounted externally the rationale for different sized apertures is well documented. A single large input and a plurality of small output opening allows more uniform air/coolant distribution. Similarly, operating the system in reverse, a plurality of small holes and a single big hole ensures better distribution because, just as the air/coolant will flow out every aperture when there is a positive

Art Unit: 1746

internal pressure, the air will flow in through every aperture when there is a negative internal pressure. In another sense, a series of smaller holes may be provided on the top of a system to prevent objects, acting under the influence of gravity to fall into the hole. While larger series of holes may be provided on the bottom of a structure, allowing for greater air circulation, without a concomitant risk of particles inadvertently being introduced to the system.

7. Applicant continued:

Second, the holes with the larger aperture areas in Strickler are on the discharge side, and the holes with the smaller aperture areas are on the introduction side, which is exactly the opposite of what is recited in independent claim 1. Furthermore, as noted in the Office Action, Strickler states (page 3, lines 8-11) that "fan modules have to work harder to blow or push cooling air through relatively smaller-sized exhaust apertures". In other words, Strickler is teaching away from Applicants' invention because Strickler requires larger-sized holes on the discharge side. Accordingly, even if combined, the Shimizu and Strickler would not have resulted in the claimed invention.

8. The arguments have been carefully considered but are not persuasive. In response to applicant's arguments, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

9. Applicant concludes by stating:

Additionally, Applicants' invention provides unexpected results, as described in page 16, line 9-page 19, line 5 of Applicants' specification. Applicants' invention provides uniform cooling of batteries inside file battery case because of its specific structure. Specifically, by making the total aperture area of the discharging side ventilating holes less than that of the introducing side ventilating holes, the flow rate of cooling air on the discharging side is increased (page 16, lines 14-22). Thus, even though the upper batteries get hotter than the lower batteries due to heat rising from the lower batteries (page 16, lines 22-25), the upper batteries can be cooled at a faster rate than the lower batteries because of the increased flow

rate on the discharging side (i.e., the side where the upper batteries are positioned), thus equalizing the temperature between the upper and lower batteries, because of the fact that, when the flow rate of cooling air is increased, cooling effect is increased in proportion to the square root of the flow rate (page 17, lines 5-7). Neither Shimizu nor Strickler discloses or suggests such an effect or advantage, or even recognizes or addresses the problem of upper batteries getting hotter than lower batteries.

10. In response to applicant's arguments, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

11. In a larger sense the suggestion that "the upper batteries can be cooled at a faster rate than the lower batteries because of the increased flow rate on the discharging side" seemingly violates fundamental laws of heat and mass transfer. First, the mass of air in is equal to the mass of air out (absent an accumulation term); as such the amount (mass) of air potentially contacting the batteries is constant. Additionally, once the cooling air has been in contact with the lower batteries it is presumably warmed at least to some degree. Heat transfer is a function of the interfacial thermal gradient; the warmer air will have a smaller thermal gradient with the upper batteries if the batteries are the same temperature. Obviously, as the upper batteries get hotter the driving force for the heat transfer will increase, but the upper batteries will have to be warmer than the lower batteries for there to be an equal number of Joules dissipated based on the claimed system. As to the argument that having the exit size half the entrance size and the suggestion that the air will move more quickly past the batteries nearer the small holes this is simply not consistent with reality. The flow, on the inside of the battery structure is a function of the amount of mass entering the container, the gas will not move more quickly when it approaches a

Art Unit: 1746

small aperture. In a steady state system mass in is equal to mass out, narrowing the space between the upper batteries will increase flow rate past the battery and will facilitate thermal homogeneity between the gas and the battery, but making smaller exit apertures will only slow the gas in terms of number of grams passing the batteries in a given unit of time.

12. The rejections will not be withdrawn at this time.

Claim Objections

13. It appears that there may have been a minor typographical error in claims 15 and 20. Both claims depend from cancelled claim 2. Since the subject matter of claim 2 was added to claim 1, the claim was construed to further limit claim 1. Correction, and as necessary clarification, is required.

Claim Rejections - 35 USC § 103—New and Maintained

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 3-7 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Laid-Open No. 9-86188 (hereinafter '188) and United States Patent No. 6,163,454 to Strickler (hereinafter '454).

Art Unit: 1746

2. As to claim 1, 7 and 12, figure 1 of '188 discloses a battery structure comprising an upper covering member (depicted as element 7B), having a plurality of holding ribs (see element 5), and in which a plurality of ventilating holes (elements 11 and 12); a middle covering member (element 7C), having a plurality of holding ribs (element 5); a lower covering member (element 7A), having a plurality of holding ribs (element 5); and two side covering members (elements 8 and 9). And a plurality of venting holes on the top and bottom (see e.g. element 11). As the limitations added to claim 1, by incorporating the limitations claim 2 and disclosing an aperture area of each of the ventilating holes formed in the upper covering member is smaller than that of each of the ventilating holes formed in the lower covering member, and the number of the ventilating holes formed in the upper covering member is larger than that of the ventilating holes formed in the lower covering member. This is identically disclosed in figure 1 of the '454 reference. With specific respect to claim 7, the connecting member is identically disclosed as elements 16 in figure 5. As to claim 12, disclosing that the "battery cell is covered with an outer tube made of resin material", the same is disclosed as element 11 in figure 2.

3. What is not explicitly disclosed is that the plurality of ventilating holes (element 11), have total aperture area is larger than a total aperture area of the ventilating holes formed in the upper covering member. This is believed to be inherent, or if not inherent overtly obvious and consistent with well known and documented design protocol. However, in the event that applicant takes the position that the different hole sizing is not inherent or well known in the art, '454 is provided for the teaching of different hole sizes. The motivation for making the combination is the same is that disclosed in '454. Specifically, see e.g. column 3, line 62,

Art Unit: 1746

disclosing why it is desirable to have relatively larger sized exhaust holes. Specifically, cooling fan modules are required work harder if they have to blow, or push, cooling air through relatively smaller-sized exhaust apertures. This additional load proves to be much more difficult and inefficient than drawing cooling air through these smaller-sized exhaust apertures. It is noted that the '454 invention is drawn to a system that overcomes the shortcomings of the prior art systems that operate with relatively larger exhaust ports. See figure 1 of the '454 reference disclosing the prior art of record systems.

4. The motivation for making the combination is as indicated above.
5. As to claim 3, disclosing a circular arc shaped holding end surfaces, on which groove portions are formed in a circumferential direction, and adhesives are filled up in the groove portions. The '188 reference discloses the disclosed groove portions. See element 13 in the drawing and associated text, especially the second full paragraph on page 3 of the provided translation. The groove is disclosed to be filled with "sealant" which is equivalent to the disclosed "adhesive" when read in light of the specification. See also page 2 of the provided translation last full paragraph.
6. As to claim 4, disclosing a tunnel part, which penetrates through the upper covering member in a longitudinal direction. Element 16 of the '188 reference discloses a tunnel penetrating the upper covering member. Further, each of the holes in the cover would read on this limitation.

7. As to claim 5 disclosing the middle covering member has strengthening ribs in a longitudinal direction. The fourth full paragraph of page 3, of the provided translation and element 15 of the drawing disclose “reinforcing ribs”, which read on the claim.

8. As to claim 6, disclosing a plurality of foot portions which are provided so as to project out from a bottom face of the lower covering are formed, and the bottom face is separated from a mounting floor for the battery case. Element 18 and associated text in the provided disclosure disclose the “foot portions” (see e.g. page 4, third full paragraph).

9. As to claim 13, disclosing that the battery case accommodates eight battery cells in total in four rows along a horizontal direction and in two rows along a vertical direction. This is identically disclosed in the figure 1 of the ‘188 reference.

10. As to claim 14, disclosing that each of joining end faces of the upper covering member, the middle covering member and the lower covering member has a straight scarf joint structure. This is identically disclosed in figure 1 of the ‘188 reference. See e.g. the end portion of the various components.

11. As to claim 15, further limiting claim 2, disclosing that the aperture area of each of the ventilating holes formed in the upper covering member is $1/2$ of that of each of the ventilating holes formed in the lower covering member. This variation, the proportional difference between the holes is the recitation of the adjustment result effective variables. As an initial matter it is believed that the exit holes of the ‘454 reference are twice the size of the entrance holes.

Art Unit: 1746

However, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. As to claim 16, further limiting claim 3, disclosing the holding ribs are at least formed at positions where both end portions of electrode groups of the battery cells are held. This is identically disclosed at figure 1 in the '188 reference. See especially element 5, and associated text.

13. As to claim 17 further limiting claim 3, disclosing the holding ribs is formed at a central position, in a longitudinal direction, of the battery cells. Again figure 1 in the '188 reference discloses this feature. See the ribs throughout the structure.

14. As to claim 18, further limiting claim 4, disclosing the tunnel part is formed at an inside of the upper covering member. As was indicated above, the holes (element 11) read on this limitation.

15. As to claim 19 and 20 disclosing a battery module having the battery structure disclosed in claim 1 and 2 respectively, the structure disclosed in figure 1 of '188 is a module.

16. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over '188 and '454 as disclosed above and United States Patent No. 5,912,092 to Maruyama ('092).

Art Unit: 1746

17. As to claim 8, disclosing a plurality of fuse holding ribs for holding a fuse from a bottom side are formed so as to project toward the fuse on an upper portion of one of the side covering members, and the fuse is held and fixed in a vertical direction by the fuse holding ribs and a fuse cover on which a plurality of fuse holding ribs for holding the fuse from an upper side are formed so as to project inside the fuse cover. As an initial matter, the structure of the fuse holder is believed to be the structural limitation. Each and every limitation of claim 8 is identically disclosed in the aggregated references, as set forth above, except the fuse holder of claim 8 is not explicitly disclosed. While the same is believed inherent in the '188 reference, which provides the aperture for the same. Nonetheless, '092 is provided for the missing element, and explicitly provides the motivation for making the combination. Specifically, column 3, line 33 *et seq.* discloses a battery package (from the title) that includes a temperature responsive fuse (see element 40 and associated text) which fuses to open a circuit in the event of an overheated condition occurring in the battery (shown as element 12).

18. As to claim 10, disclosing external output terminals are formed vertically via an insulating material so as to stride over the fuse on the upper portion of one of the side covering members. Figure 1, of the '188 reference discloses external output terminal formed vertically via an insulating material (16 and associated text). A fuse can stride over the upper portion of the side covering.

19. As to claims 9 and 11, disclosing an accommodating portion for accommodating a battery cell control unit disposed at an upper portion of another of the side covering members, a plurality

Art Unit: 1746

of unit holding ribs for holding the battery cell control unit from a bottom side are formed so as to project toward the battery cell control unit, and the battery cell control unit is held and fixed in a vertical direction by the unit holding ribs and a battery cell control unit cover on which a plurality of unit holding ribs for holding the battery cell control unit from an upper side are formed so as to project inside the battery cell control unit cover. The presence of a control unit is not explicitly disclosed in either '188 or '454. However, a control panel is disclosed in '092 as element 34. See e.g. column 3, line 53 *et seq.* The motivation for providing the control panel is explicitly disclosed in the '092 reference. Specifically, the control unit prevents overcharging and indicates when charging is indicated. The specific placement of the control unit is believed to be inherent in the '092 reference, however, with regard to the specific placement it has been held that rearranging parts of an invention involves only routine skill in the art. See *In re Japikse*, 86 USPQ 70.

20. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Laid-Open No. 9-86188 (hereinafter '188), United States Patent No. 6,163,454 to Strickler (hereinafter '454) as discussed above and United States Patent No. 6,225,788 to Kouzu et al. ('788).

21. Each and every limitation of claim 21 is disclosed in the combination of '188 and '454 as set forth above, except that the combination fails to explicitly disclose voltage detecting leads associated with the battery structure for detecting voltages of each battery cell. Initially, it is important to note that leads usually do not detect voltage. It is presumed that there is a voltage

Art Unit: 1746

detector connected to the lead. If it is simply a lead the same is disclosed in the '188 reference. If applicant intended a means for determining capacity, the same is disclosed in the '788 reference. Namely the '788 reference discloses a means for determining battery capacity can be constituted such as to calculate the state of charge of a single or a plurality of battery module units by looking up the voltage, current and temperature detected by the individual means for detection in a voltage/current data table which is previously found corresponding to each battery temperature; thus, by looking up the individual detection values on the voltage/current characteristics for each battery temperature which were previously found, it is possible to learn the change in the state of charge at a single or a plurality of battery module units. See e.g. column 3, line 65 *et seq.*

22. The artisan would have been motivated to make the instant combination for the reasons explicitly set forth in the '788 reference. Specifically, the '788 reference provides that the addition of the state of charge monitor allows the controller to permit the power source to be "maintained in a correct operating condition wherein neither overcharging nor undercharging occurs." (Abstract.)

Office action Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

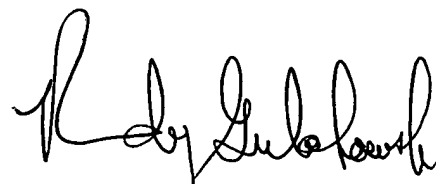
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
Art Unit 1746

August 16, 2003


RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700